Microsoft


*Operating System*

# User Data and User Settings Management

## Beta 3 Technical Walkthrough

**Abstract**

This document contains information about the User Data Management and User Settings Management features that are available in the Microsoft® Windows® 2000 operating system. User Data Management and User Settings Management are part of the new IntelliMirror™ management technology features of Windows 2000. These features allow administrators to reduce the total cost of ownership (TCO) for personal computers (PCs) in their organizations.

This walkthrough describes scenarios that illustrate the benefits of User Data Management and User Settings Management. It is designed to help administrators understand how they might want to use these features within their organizations.

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# INTRODUCTION

People use computers when they are not connected to a network (the stand-alone state) as well as when they are connected to a network (the networked state). In the course of doing their jobs, people frequently transition between these two states. The IntelliMirror™ management technologies, and specifically User Data Management and User Settings Management, make it possible for people to get the most out of their personal computers, because data and settings follow the user without regard to whether they are in the stand-alone state or connected to a network. The increased availability of a user's data and his or her personal environment is a result of storing that information on network servers as well as in synchronized off-line locations on the local hard drive.

Users can log on to any computer and have access to their own data and documents, their own preferences, and their own applications, without having to understand what is happening to make this occur. While the user's exposure to the IntelliMirror features is transparent—they do not see a Start menu item called IntelliMirror—the administrator does need to perform certain configuration tasks.

This walkthrough discusses how to get started with two of the primary feature sets in IntelliMirror: User Data Management and User Settings Management. For reference, the following table outlines all of the IntelliMirror feature sets:

| Change and Configuration Management | Feature | Benefits | Technologies |
|---|---|---|---|
| IntelliMirror | User Data Management | **My data and documents follow me!** Users can have access to the data they need to do their jobs, whether online or offline, when they move from one computer to another on the network. Administrators manage this feature centrally by policy to minimize support costs. | Active Directory™<br>Group Policy<br>Offline folders<br>Synchronization Manager<br>Enhancements to the Windows® shell<br>Folder Redirection<br>Disk quotas |
| | Software Installation and Maintenance | **My software follows me!** Users have the software they need to perform their jobs. Software and optional features install "just in time." Once installed, software is self-repairing Administrators manage application and OS upgrades as well as application deployment centrally by policy. This minimizes support costs. | Active Directory<br>Group Policy<br>Windows Installer<br>Add/Remove Programs in the Control Panel<br>Enhancements to the Windows shell |
| | User Settings Management | **My preferences follow me!** Users see their preferred desktop arrangements from any computer. A user's personal preferences and settings for desktops or software are available wherever the user logs on. Administrators manage this feature centrally by policy to minimize support costs. | Active Directory<br>Group Policy<br>Offline folders<br>Roaming user profiles<br>Enhancements to the Windows Shell |
| | Remote OS Installation | Administrators can enable remote installation of Windows 2000-based operating systems and desktop images on new or replacement computers with out on-site technical support. | Active Directory<br>Group Policy<br>Dynamic Host Configuration Protocol (DHCP)<br>Remote Installation Services |
| | IntelliMirror + Remote OS Installation ⟶ Machine Replacement | | |

*Change and Configuration Management*

## User Data Management

User Data Management is concerned with the data that the user can see—primarily user documents and personal files. User data can follow the user because Windows 2000 can store the data in specified network locations while making it appear to the user as if it was stored locally.

There are several ways in which an administrator can arrange for a user's data to follow that user. The administrator can configure the functionality manually, set it up on a per-user basis, or configure it through Group Policy.

The key method to make a user's data follow that user is to redirect specific user data folders (such as My Documents) to a network location, and then make this location available for off-line use.

When a user then saves a file to the My Documents folder, the file is actually saved on the network location, and the local computer is synchronized with the network copy. This synchronization occurs in the background and is transparent to the user.

The user works in the same way whether he or she is in the stand-alone or networked state, and is therefore unaffected by temporary network outages. When a user works off-line, either through choice or because of a network failure, all modifications and changes to user data are made to the local copy. In due course, when the computer is reconnected to the network, synchronization with the network copy occurs automatically.

In the case that the networked and the local copy have both changed in the interim, the Synchronization Manager prompts the user for advice as to whether to save both copies or synchronize one copy with the other copy.

## User Settings Management

User settings, like user data, can follow the user—regardless of the where that user logs on. User settings follow users because IntelliMirror uses Group Policy and the Microsoft Active Directory™ directory service to store all important user settings.

Administrators can use settings to customize and control users' computing environments and to grant and deny the users the ability to customize their own computing environments. These settings can be applied so that they affect users and computers. Where users have permission, they will often customize the style and default settings of their computing environment to suit their needs and work habits.

Settings contain three types of information:

- Vital information (both personal and administratively set)
- Temporary information
- Data specific to the local computer

In an environment where users are permitted to use more than one computer, temporary and local computer information typically should not roam with that user, as this can cause unnecessary overhead, and differences between computers could disrupt the roaming function.

When Windows 2000 manages user settings using Group Policy and well behaved applications[1], it ensures that only vital information is retained, while temporary and local computer settings are dynamically and appropriately regenerated as required. This allows users to have a similar experience on any computer they log on to.

[1] Well-behaved applications are applications that meet the Windows 2000 Logo or those that meet the best practices for user and computer state separation.

## User Data and User Settings Management Technologies

The technologies that enable User Data Management and User Settings Management are the same; the main difference between the technologies is that a user is generally acutely aware of his or her data, while the same user may not be aware of settings. Settings are the data that applications need to preserve the users state. Examples of settings include a user's custom dictionary, .ost files, and data that control the look and behavior of applications.

The technologies that this walkthrough will address are:

- **Roaming User Profiles**. These allow users to roam among computers within the corporate network. If a user has a Roaming User Profile (RUP), he may log onto a computer, run applications and edit documents, and log off. At log off, the user's user profile is copied to a server. When the user logs on to another computer, all of the profile information, including any **Start** menu customizations and the contents of the My Documents folder, are copied to the second computer.
- **Folder Redirection**. This is a unique feature of Windows 2000 that allows users and administrators to redirect the path of a folder to a new location. The new location can be a folder on the local computer or a directory on a network share. Users have the ability to work with individual or shared documents on a secure server as if they were based on the local drive.
- **Offline Files**. These make it possible for users to work with networked documents. If a user has enabled a file or folder to be available offline, a copy of the shared file or folder is stored on the local computer. If the computer has no network access, the user can edit the local version of the cached document. When network access is restored, the edited document is copied back to the network share.

The remainder of this walkthrough explains how to use each of these three technologies.

## ROAMING USER PROFILES

In general, the implementation of Roaming User Profiles (RUP) in Windows 2000 is similar to the Windows NT 4.0 implementation. Details on the differences are documented in Appendix A.

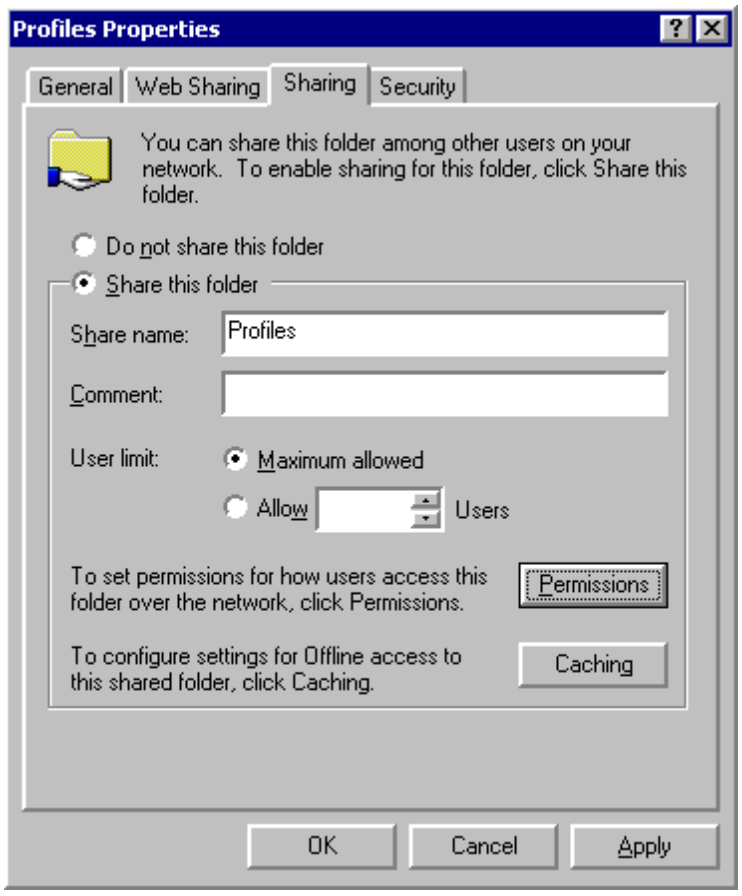
If you are unfamiliar with RUP, it is suggested that you read the sections on it in the Windows NT 4.0 Resource Kit or the white paper, “Guide to Microsoft Windows NT 4.0 Profiles and Policies,” located on the World Wide Web at: http://www.microsoft.com/ntserver/management/default.asp

### IT Administrator

The administrator logs on to a server, creates a network share to store roaming user profiles, and then makes users “roaming users.”

**To create a shared folder to store Roaming User Profiles**

1. If you have not already done so, log on to the MSMSRV01 server as an administrator.
2. Double-click the **My Computer** icon to open it.
3. Double-click the hard-drive icon of the **Local Disk** where you want to place the roaming user profiles.
4. In the **File** menu, select **New** and click **Folder**.
5. Under the New Folder in the selected drive pane, type:
   `Profiles`
6. Click **Profiles**.
7. Right-click the **Profiles** folder and select **Properties** from the context menu. The Profile Properties page appears.
8. Click the **Sharing** tab.
9. Select **Share this folder**.

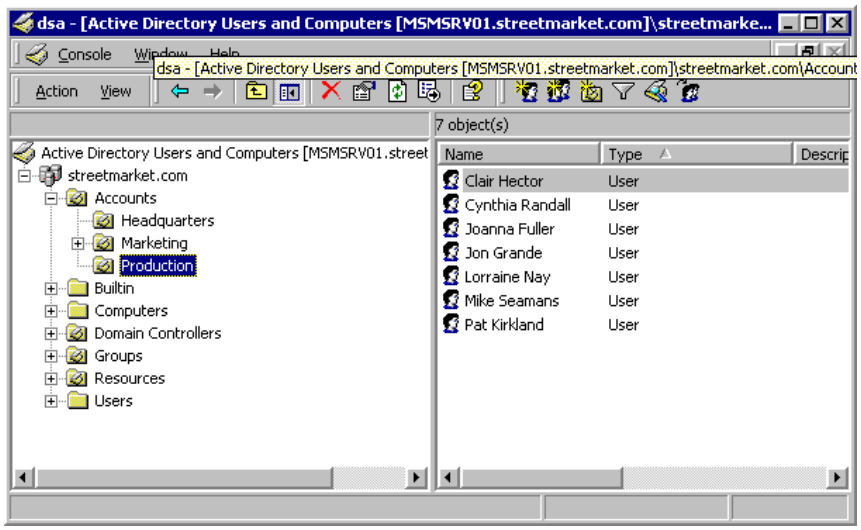



*Profiles Properties*

10. Click **OK**.

**To make Claire Hector a roaming user**

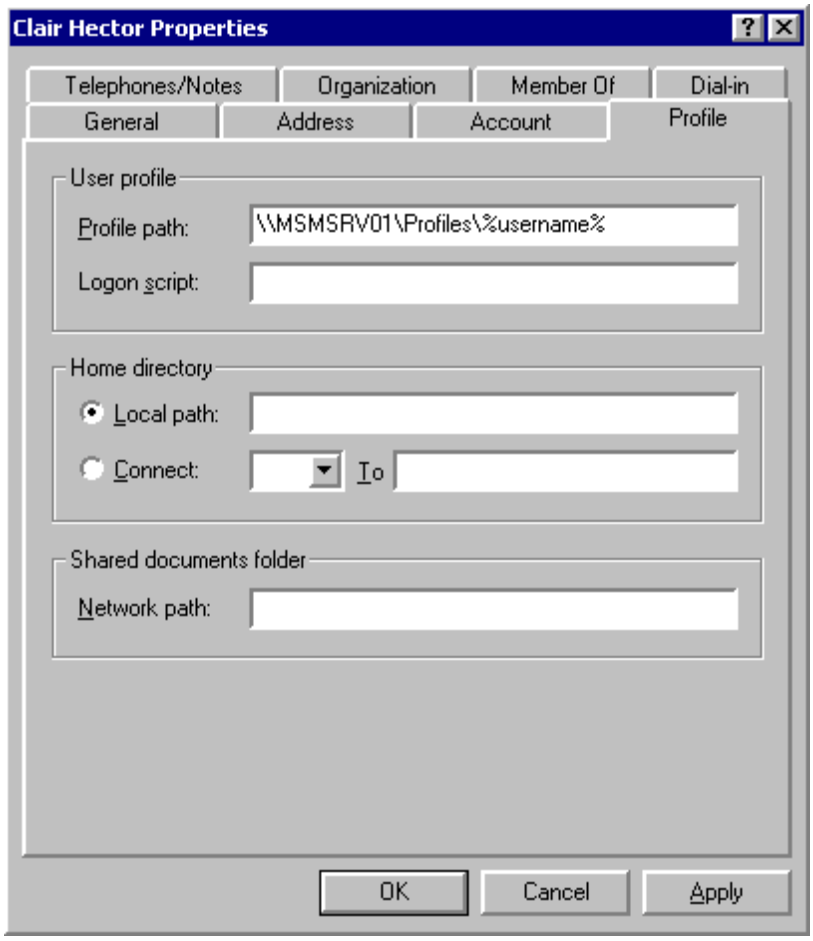
1. On the **Start** menu, point to **Programs**, and click **Administrative Tools**.
2. Click **Active Directory Users and Tools**.
3. Click the plus sign (**+**) next to **streetmarket.com** to expand the tree.
4. Click the plus sign (**+**) next to **Accounts**.
5. Click the plus sign (**+**) next to **Production**.




*Active Directory Users and Computers snap-in*

6. Right-click **Claire Hector**, and select **Properties** from the context menu.
7. Click the **Profile** tab.
8. For the profile path, type:

   **`\\MSMSRV01\Profiles\%username%`**




*Clair Hector Properties*

**Note**: %username% is an environment variable. In this case, %username% maps to Claire Hector's user name, CHector. When Claire Hector logs on to a computer, Windows NT will create the directory "CHector" in the Profiles share on MSMSRV01.

9. Click **OK**.
10. To close the Active Directory Users and Computers snap-in, click **Console** and then click **Exit**.

## User

In this part of the roaming user profiles scenario, log on as Claire Hector (CHector@streetmarket.com) who is now a roaming user.

**To create a custom bitmap (wallpaper)**

1. On the **Start** menu, point to **Programs**, and then click **Accessories.**
2. Click **Paint**.
3. Use Paint to draw something that you will use as wallpaper.

4. Click the **File** menu.
5. Click **Save As**.
6. In the **File name** text box, type:

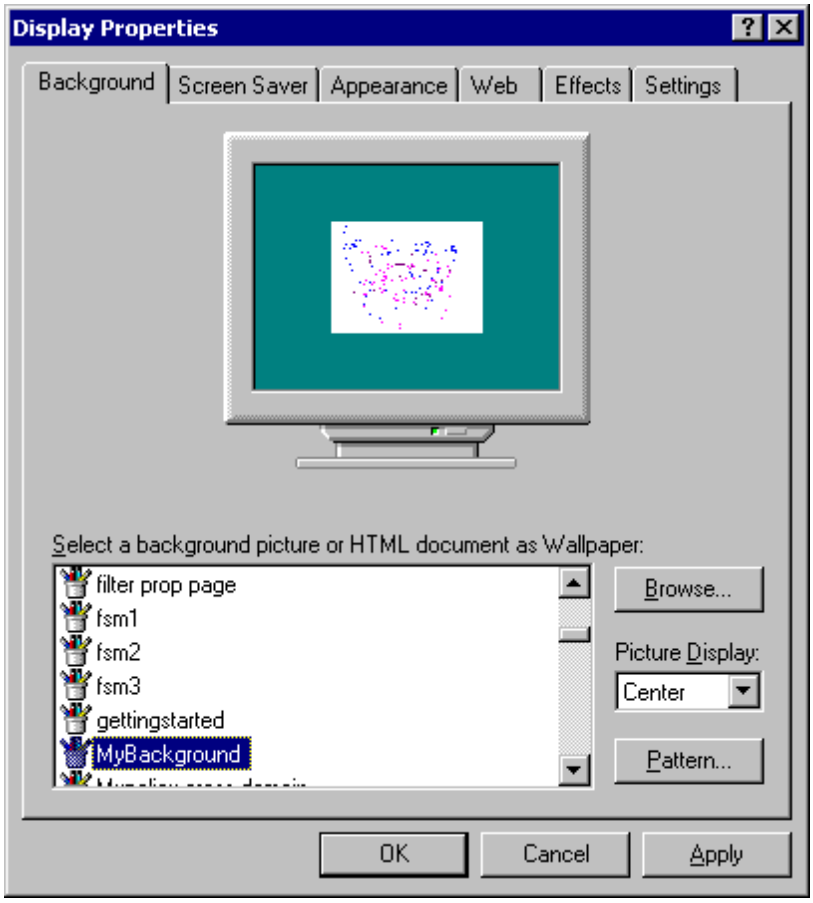
   **`MyBackground`**

   Notice that the system saves the file in the My Pictures folder.
7. Click **Save**.
8. To close Paint, on the **File** menu, click **Exit**.

If you did the Group Policy walkthrough before this walkthrough, you may need to adjust the policy to ensure that Claire Hector has the ability to change her wallpaper.

**To make the bitmap the wallpaper (background)**

1. Right-click the **Desktop.**
2. Click **Properties** on the context menu.
3. Select the bitmap you just created in the list box.




*Display Properties*

4. Click **OK.**

At this point, log off of the computer and log on to a different computer as Clair Hector (CHector@streetmarket.com). The wallpaper on the second computer should be the same as the wallpaper on the first computer; that is, Clair Hector's settings should follow her.

## FOLDER REDIRECTION

Folder redirection is a way to place data in a set of folders in the users profile on the network. This can be combined with local or Roaming User Profiles. Besides the availability and backup benefits of having the data on the network, the users will also have performance gains with slow links and subsequent log ons.

### IT Administrator

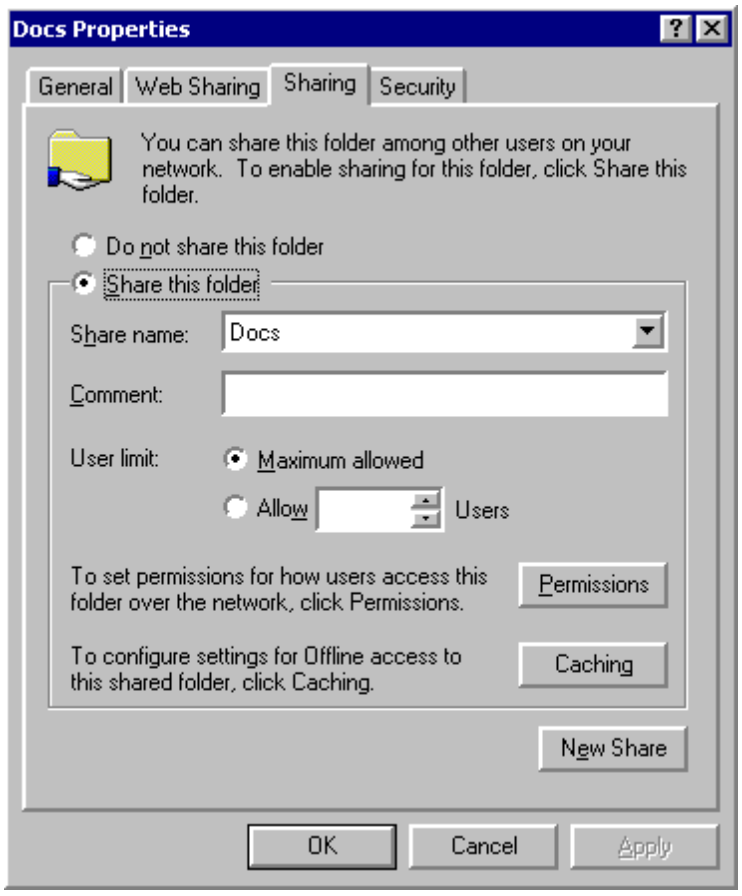
The administrator logs on to a server, and redirects users' My Documents folders to a server.

**To create a shared folder for users' My Documents folders**

1. If you have not already done so, log on to the MSMSRV01 server as an administrator.
2. Double-click the **My Computer** icon to open it.
3. Double-click the hard-drive icon of the **Local Disk** where you want to place the My Documents folders.
4. In the **File** menu, select **New** and click **Folder**.
5. Under the New Folder in the selected drive pane, type:

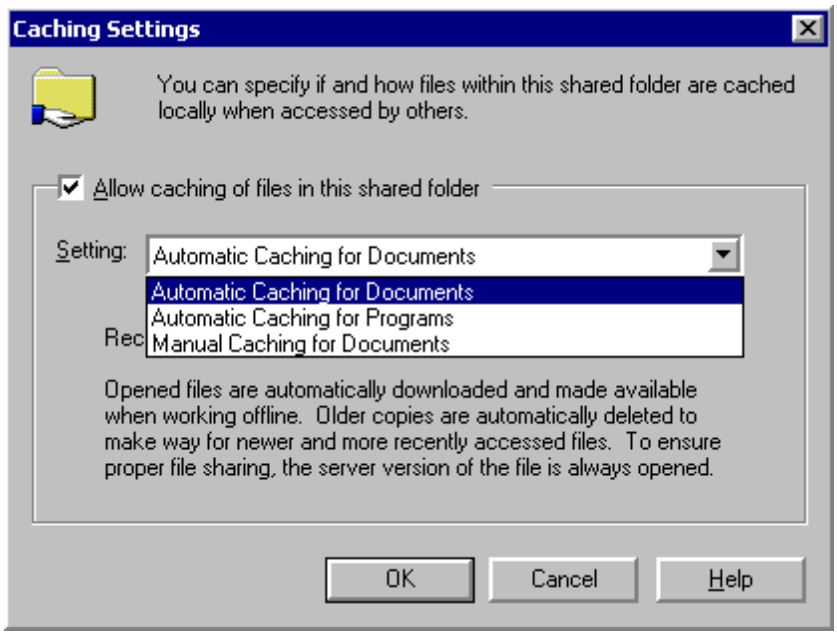
   ```
   Docs
   ```

6. Click the **Docs** folder.
7. On the **File** menu, click **Properties**.
8. Click the **Sharing** tab.
9. Select the **Share this folder** button.




*Docs Properties*

10. Click the **Caching** button.

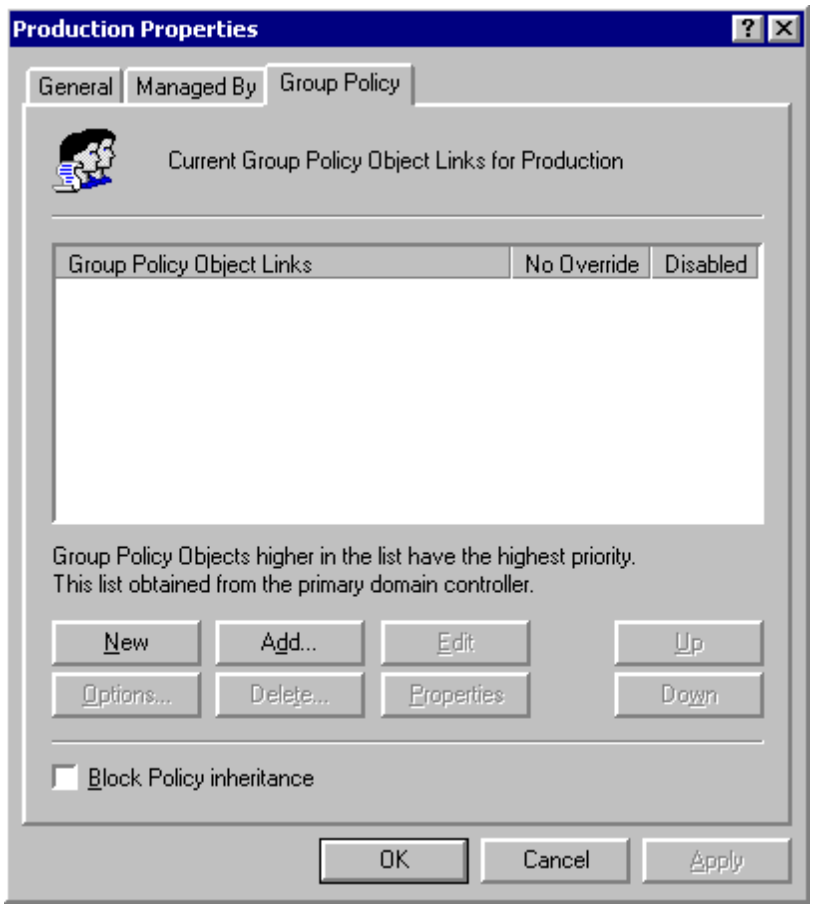



*Caching Settings*

11. In the **Setting** list box, select **Automatic Caching for Documents**.
12. Click **OK**.
13. Click **OK**.

**To redirect the users' My Documents folders to the network**

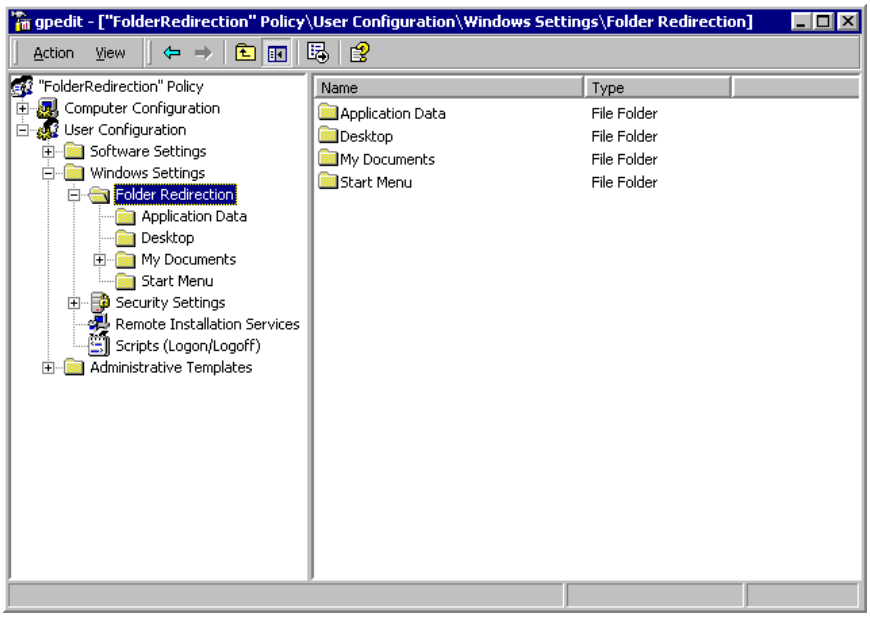
1. From the **Start** menu, point to **Programs** and then click **Administrative Tools**.
2. Click **Active Directory Users and Computers**.
3. Double-click **streetmarket.com**.
4. Double-click **Accounts**.
5. Double-click **Production**.
6. Right-click **Production**, and select **Properties**.




*Production Properties*

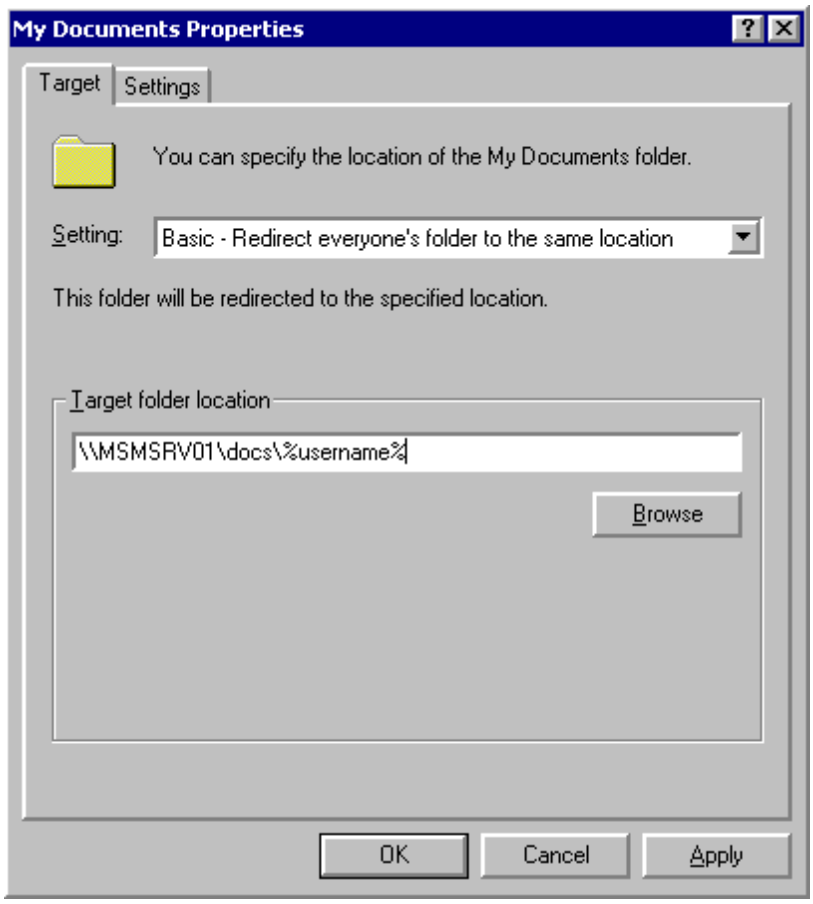
7. On the Production Properties page, click **New**.
8. For the **New Group Policy Object** name, type:

   **`Redirect My Docs`**
9. Press the Enter key.
10. Click **Edit** to edit the Redirect My Docs Group Policy Object (GPO).




*Editing the Redirect My Documents GPO*

11. Double-click **User Configuration**.
12. Double-click **Windows Settings**.
13. Double-click **Folder Redirection**.
14. Click **My Documents**.
15. On the **Action** menu, click **Properties**.

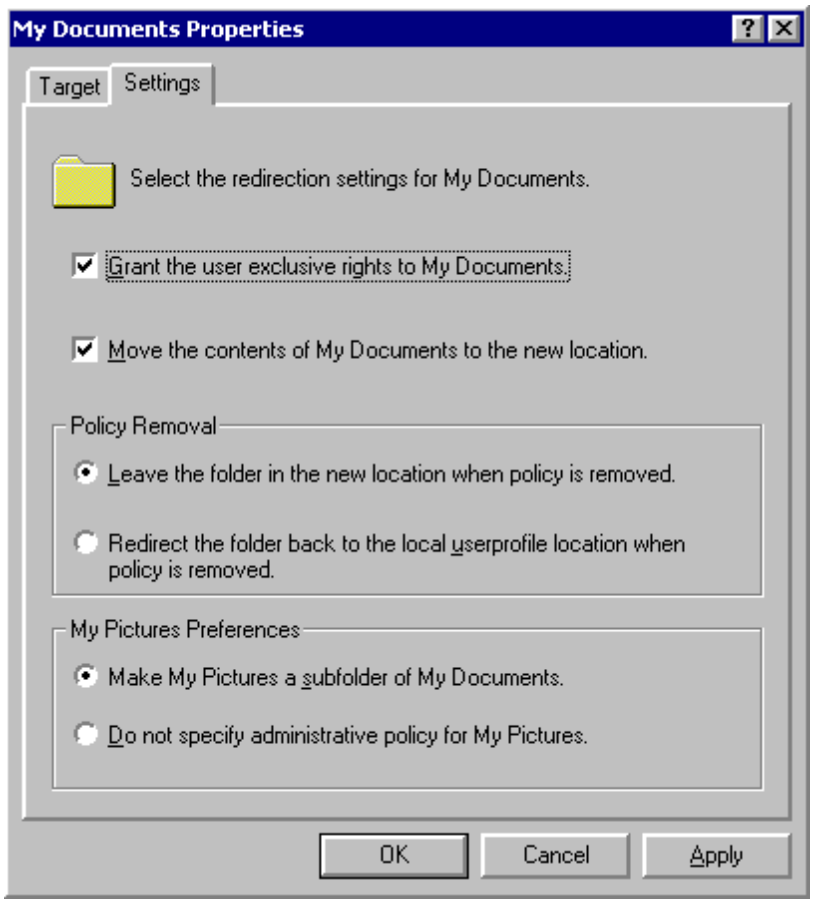



*My Document s Properties*

16. On the My Documents Properties page, in the Settings: drop down box select **Basic – Redirect everyone's folder to the same location**.
17. On the My Documents Properties page, in the **Target folder location** text box type:

    **`\\MSMSRV01\Docs\%username%`**

18. Click the **Settings** tab.




*My Documents Properties – Settings Tab*

19. Select **Grant the user exclusive rights to My Documents**. This sets the NTFS security descriptor for the %username% folder to full control for the %user% and Local System.
20. Select **Move the contents of My Documents to the new location**. This moves any documents the user has in the local My Documents to the server share.
21. Click **OK**.
22. Close the Group Policy snap-in.

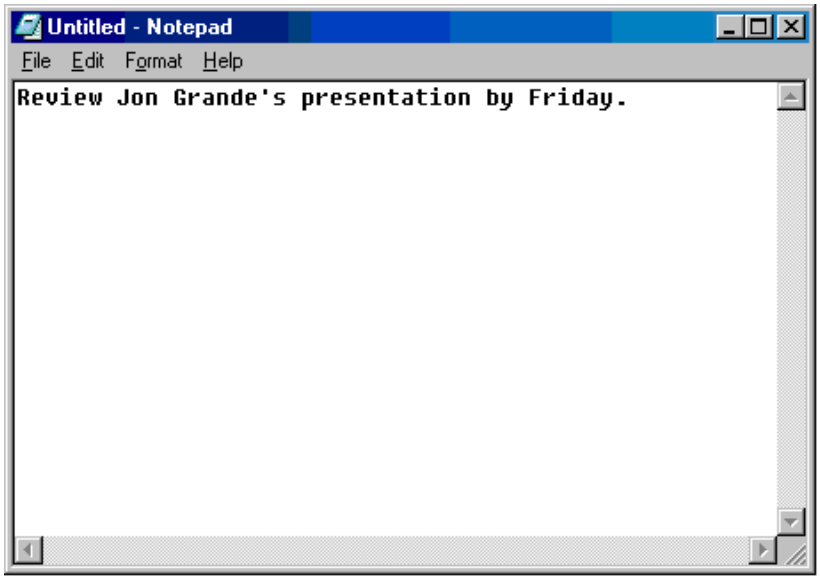
## User

Before beginning this portion of the walkthrough, be sure to complete the Folder Redirection scenario.

**To create a document in the My Documents folder**

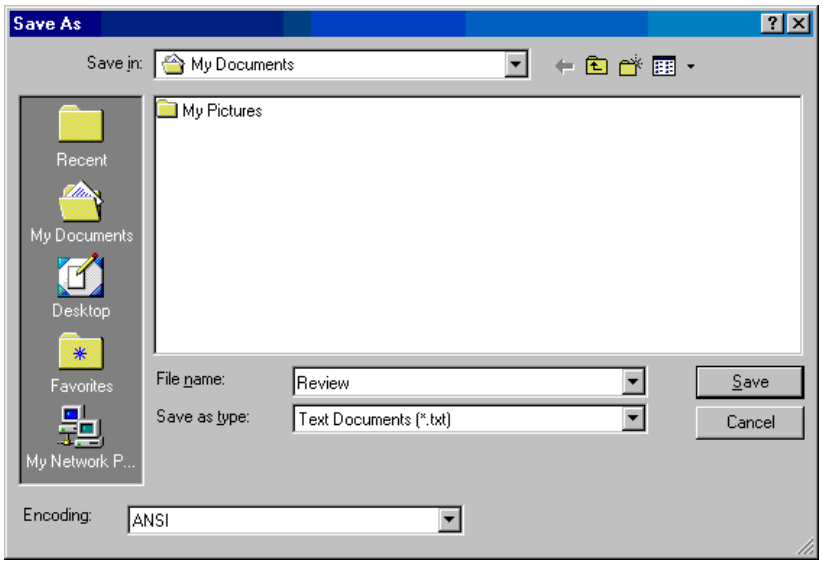
1. Logon to MSMWKS1 as CHector (CHector@streetmarket.com)
2. Click on **Start.**
3. Click on **Programs.**
4. Click on **Accessories.**
5. Click on **Notepad**.
6. In Notepad, type:

   **`Review Jon Grande's presentation by Friday.`**




*Notepad with new data*

7. On the **File** menu, click **Save As**.




*Save As*

Make sure that the Save As dialog box is pointed at the My Documents folder.

7. In the File name text box, type:

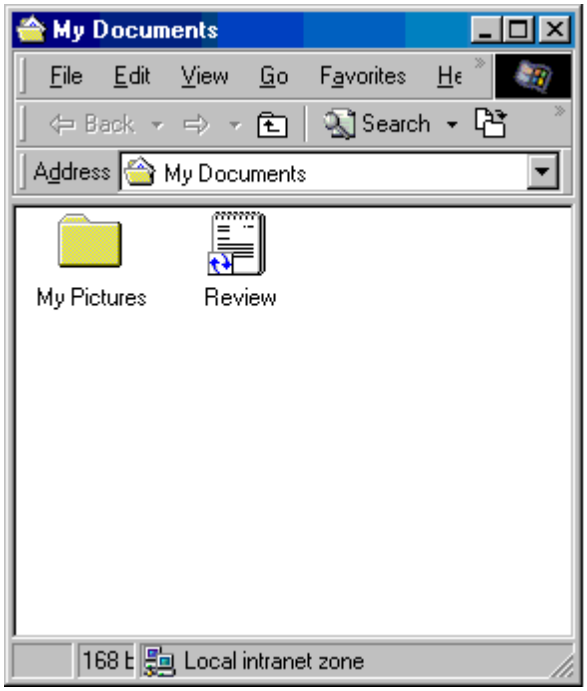
   **`Review`**

8. Click **Save**.
9. To close Notepad, on the **File** menu, click **Exit**.

**To make the My Documents folder available for offline use**

1. From the desktop, right-click **My Documents**.
2. Click **Make Available Off-line** from the context menu.
3. On the Offline Files Wizard, click **Next**.
4. Click the check box for **Automatically synchronize the Offline Folders when I log on and log off my computer.**
5. Click **Next**.
6. The **Enable reminders** check box will be selected. Click **Next**.
7. On the Confirm Offline Subfolder dialog box, select **Yes, make this folder and all of its subfolders available offline**.
8. Click **OK**.
9. Double-click **My Documents** to open the folder.

   Notice that the icon for Review has changed to reflect Review's availability while offline.
10. Close the My Documents folder.




*Review (with icon reflecting availability offline)*

**To disconnect from the network**

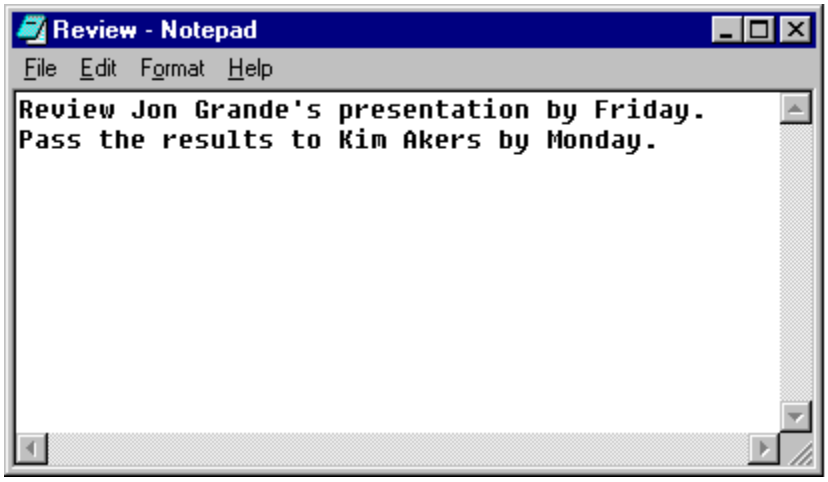
1. To disconnect from the network to simulate working offline, disconnect your network cable from your computer.
2. Double-click on **My Documents**.
3. Eventually, you will see a computer icon on the tray (the lower right-hand corner of the screen). If you hover the mouse near this icon, it will say, “Offline Files – the network is not available.”


*Offline Files Icon in the System Tray*

**To edit a document while offline**

1. Double-click **Review** in the My Documents folder to open it.
2. Type the following new line:

```
Pass the results to Kim Akers by Monday.
```




*Changes to the Review Notepad File*

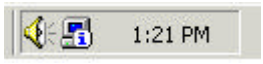
3. On the **File** menu, click **Save**.
4. On the **File** menu, click **Exit**.

**To reconnect to the network**

- Reconnect the network cable.

**To synchronize offline documents with the server**

1. In the System Tray, click the computer icon.




*Network Available*

2. In the Offline Files Status dialog box, click **OK**.
3. In the Close Open Files dialog box, click **OK**.

   The version of **Review** that was stored on the server is replaced with the newer **Review** file from the local computer.

   You can also synchronize from **Synchronize** in the **File** menu after selecting the file you wish to synchronize, or the **Synchronize** button in the web view for that file.

**To verify that changes were propagated to the server**

1. On the desktop, double-click **My Documents**.
2. In the **My Documents** window, double-click **Review**.
3. In Notepad, you see the text that you edited while offline.

# APPENDIX A: ROAMING USER PROFILE CHANGES IN WINDOWS 2000

This section provides information on the differences between Windows NT 4.0 and Windows 2000.

There are a few changes to Roaming User Profiles to increase the usability and resilience of the feature:

- New Merge Algorithm
- New Name space
- New Location

There are also two features that were added in Windows NT 4.0 SP 4 that are included.

- Ability to not roam folders.
- Quotas on Profile size.

## New Merge Algorithm

This is a high-level overview of the changes to the user profile replication algorithm and the reasons these changes where made.

### Overview of Windows NT 4.0 Merge Algorithm

In Windows NT 4, the algorithm is an Xcopy with full synchronization support. That is, it has the ability to mirror a profile from one location to another, and any extra files or directories in the destination location are deleted. The algorithm is based on the idea that there a single master profile at anyone time. When the user is not logged on, the master profile is on the server. When the user is logged on, the master profile is on the local computer. This works well for users who only log on to a single computer, but in the case of users logging onto multiple computers at the same time, this can lead to data loss.

Here is how the algorithm worked in more detail:

1. The user logs onto computer A (his primary computer).
2. The roaming profile is Xcopied from the server location to his local profile location. For example: \\scratch\scratch\joe to c:\winnt\profiles\joe.
3. The user creates some documents, changes colors, etc and all of these changes are stored in the local profile location.
4. At logoff time, the profile is Xcopied from the local location back to the server location.

This is an exact mirroring process; if there were any extra files in the server location, they are deleted to make sure the server location is an exact duplicate of the local profile.

The problem occurs if the user has two or more computers. Building upon the example above:

1. The user logs onto computer A.
2. The user logs onto computer B.

3. The user creates a document on computer A and stores it in his profile.
4. The user logs off of computer A.
5. The user logs off of computer B.

The document created in step 3 will be deleted because from computer B's perspective, it has the master profile locally and the extra files in the server should be deleted so that the local profile is now the master server profile.

A similar data loss problem occurs when files are edited. For example, if the user has a document called "document.doc" in his My Documents folder in the server copy of the profile:

1. The user logs onto computer A.
2. The user logs onto computer B.
3. The user edits the document on computer A.
4. The user logs off of computer A.
5. The user logs off of computer B.

The changes made to the document on computer A are lost because when the user logged off of computer B, the older version of the document overwrote the new version of the document because it believed it had the master version of the profile.

These two issues have been fixed in the Windows 2000 version of the algorithm.

### Overview of Windows 2000 Merge Algorithm

The Windows 2000 algorithm now has support for merging of user profiles (at the file level) and support for last writer wins. This means that new files and files that have been updated will not be deleted or overwritten.

In the situation where an existing document has been updated, the new algorithm checks the time-date stamp of the destination file against the source file. If the destination file is newer, it will not be overwritten.

At log on, the current time is saved, and then at logoff time, this third timestamp is used to determine which files are new in the server profile and which files have been deleted in the local profile. For example, the server profile has a document in the My Documents folder called "review.doc." This file does not exist in the local profile, so either it is a new file from a different computer, or it was in the local profile originally and the user deleted it. By knowing the timestamp of when this profile was loaded, you can compare review.doc against it. If review.doc was created (or written to) after the profile load time, it should be preserved because it came from a different source. If the review.doc timestamp is older than the load time, it should be deleted (because it would have been copied to the local computer at load time).

In addition, there may be cases where some files need to be removed from the local cache so that deletes between sessions remain deleted. For example:

1. The user logs onto computer A.

2. The user creates edits a document on computer A.
3. The user logs onto computer B.
4. The user logs off of computer B; B has copy of doc.
5. The user deletes the document and logs off computer A.

To make sure the deletion takes effect, the cached version of the profile is synchronized with the profile server at logon time; all files in the local cache that are not present in the server and were not modified since the last logoff time are deleted.

With these changes, Windows now has the ability to merge user profiles. This also allowed the removal of a confusing dialog, which prompted the user to pick a profile (local or roaming).

## New Namespace

There are several new folders in the All Users profiles:

- Templates
- Favorites
- Documents.
- Application Data has been moved into the profile.

(Items below in **Bold** = visible to user logged on)

```
C:\
<Windows NT OS files hidden>
Program Files
    <soft barrier>

WINNT
    <soft barrier>

Recycled                    ; one per drive, per-user trash
Documents and Settings      ; created for new installs of Windows 2000
    Joe                     ; Pointed to by %UserProfile%
        NTUSER.DAT          ; contents of HKEY_CURRENT_USER
        My Documents
            My Pictures     ; shortcut to local My Pictures
        Start Menu
        Desktop
        Favorites
        Templates           ; per-user customized templates
        Recent
        SendTo
        NetHood
        PrintHood
        Application Data[1] ; per-user roaming app data
            Microsoft Internet Explorer
                Cookies
                Quick Links
        ;the following section does not roam by default
        Local Settings      ; Pointed to by %UserProfileLocal%
```

Per-user roaming data

**Temp** ; must be visible for backwards compatibility
Classes ; per-user classes root (file)
Application Data[2] ; per-user non-roaming app data
History
Temporary Internet Files

**All Users**

**Start Menu**
**Desktop**
**Favorites**
Templates
Application Data[3] ; per-machine (global) app data
… .
Administrator
Default Users

1. **Per-User and Roaming**. Application data is stored when the data must roam with the user from one computer to another. This is typically smaller and/or very important data, such as the IE favorites, quick links, cookies and the Outlook Express personal web address book.
2. **Per-User and Local Only (Non-Roaming)**. Application data is stored here if the data should stay on the local computer and not roam with the user. This is typically less important, larger or regenerable data, such as the IE temporary internet cache, history, TEMP folder and the contents of the Recycled.
3. **Per-Machine (Global)**. Application data is stored here if it is meant to be viewed or used by everyone who uses the computer. This data does not roam with any of the users of the computer. This one is much less frequently used. If your app is installed for an individual user, you may not have any app data here. If you app is installed common (for everyone), you might put tons of data, such as templates or samples; anything that multiple users may want to use. For any thing offered in this area that is then later customized by a user (such as a template), the updated per-user version should be stored in the per-user area.

## New Location of the Users Profile on the Local Computer

To assist with computer lockdown, on a new Windows 2000 installation, the user profiles folder is located at:

**"%SystemDrive%\Documents and Settings"**

This typically translates to C:\Documents and Settings.

On an upgrade from Windows 9x with user profiles disable, the same is done.

On an upgrade from Windows 9x with user profile enabled or Windows NT 3.x or Windows NT4, the user profiles folder is located at

**"%SystemRoot%\Profiles"**

Which typically translates to C:\WinNT\Profiles. This was not moved as some

applications have hard coded paths and would break if the profile location moved.

The below table summarizes the locations

| OS | Upgrade | Clean Install |
|---|---|---|
| Windows 9x | %SystemDrive%\Documents and Settings | %SystemDrive%\Documents and Settings |
| Windows 9x with Profiles enabled | %SystemRoot%\Profiles | %SystemDrive%\Documents and Settings |
| Windows NT 3.x && 4.0 | %SystemRoot%\Profiles | %SystemDrive%\Documents and Settings |

There is now a switch to unatted.txt that allows the installer of Windows 2000 to specify the location of the Profiles folder. Set the following in “GuiUnattended“ Section of unattended file.

```
profilesdir = "%systemroot%\profiles"
```

Once Windows is installed, there is no supported way to move the Profiles folder.

## Non-Roaming Folders

### Windows 2000 and Windows NT 4.0

In Windows 2000, roaming user profiles are still copied from the server to the client at log on and copied back at logoff, but introduced a per-user local settings folder into the user profile that is not copied during log on or logoff. In this folder, operating system components and other applications can store non-roaming per-user data.

For example, Microsoft Internet Explorer can store a user’s Favorites in the roaming portion of the user profile and store the IE Cache (Temporary Internet Files) in the local (non-roaming) portion of the user profile. As noted in the Namespace section there is a default set of folders that does not roam. You can configure any folder to not roam using policy.

On Windows 2000 this is done using the Group Policy Editor. The path in the Name space is:

```
User Configuration\Administrative Templates\System\Logon/Logoff
```

Policy is called **“Exclude directories in roaming profile”**.

## Quotas on Profile Size

### Windows 2000 and Windows NT 4.0

The Proquota.exe is a utility that can be set up to monitor the size of users profiles. If an individual user's profile exceeds the predetermined file limit, the user won't be able to log off of the computer until the user reduces the size of the file. It is configured using policy.

On Windows 2000 this is done using the Group Policy Editor. The path in the Name

space is:

**`User Configuration\Administrative Templates\System\Logon/Logoff`**

Policy is called **"Limit profile size"**.

## FOR MORE INFORMATION

For the latest information on Microsoft Windows 2000 network operating system, visit our World Wide Web site at http://www.microsoft.com/windows/server/ and the Windows NT Server Forum on the Microsoft Network (GO WORD: MSNTS).

For the latest information on the Windows 2000 Beta 3, visit the World Wide Web site at http://ntbeta.microsoft.com/.

For the white paper, *Guide to Microsoft Windows NT 4.0 Profiles and Policies*, see http://www.microsoft.com/ntserver/zipdocs/prof_policies.exe.

### Before You Call for Support

Please keep in mind that Microsoft does not support these walkthroughs. The purpose of the walkthroughs is to facilitate your initial evaluation of the Microsoft Windows 2000features. For this reason, Microsoft cannot respond to questions you might have regarding specific steps and instructions.

### Reporting Problems

Problems with Microsoft Windows 2000 Beta 3 should be reported via the appropriate bug reporting channel and alias. Please make sure to adequately describe the problem so that the testers and developers can reproduce it and fix it. Refer to the Release Notes included on the Windows 2000 Beta 3 distribution media for some of the known issues.